S. I. PRESCOTT.
CARBURETER.
APPLICATION FILED APR. 21, 1910.

994,195.

Patented June 6, 1911

2 SHEETS—SHEET 1.

Fig. 4

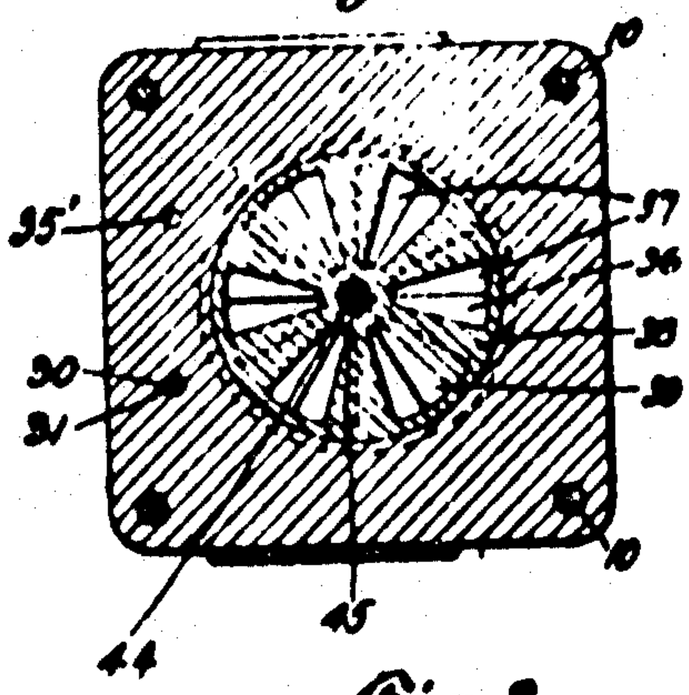


Fig. 1

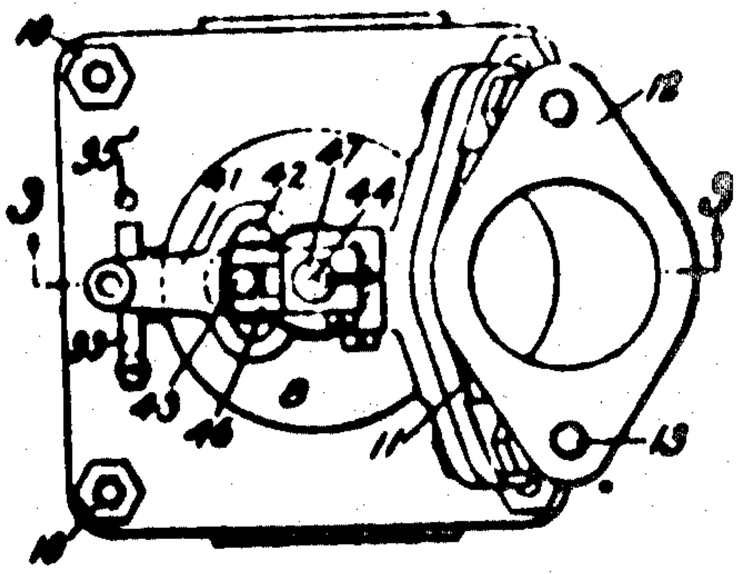


Fig. 3

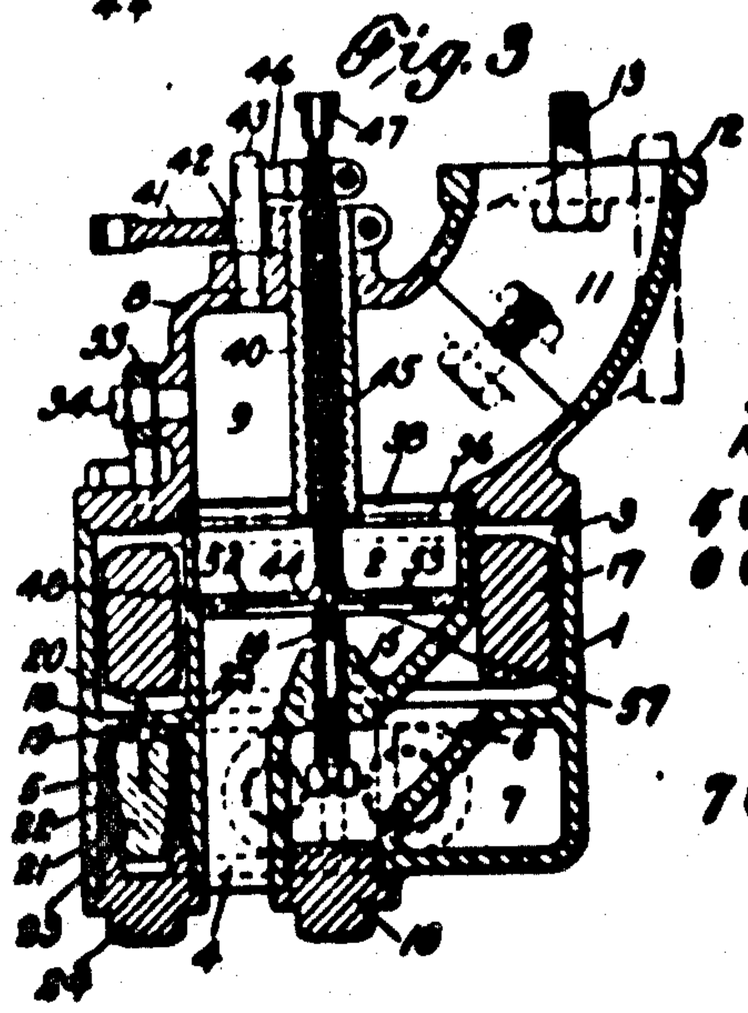
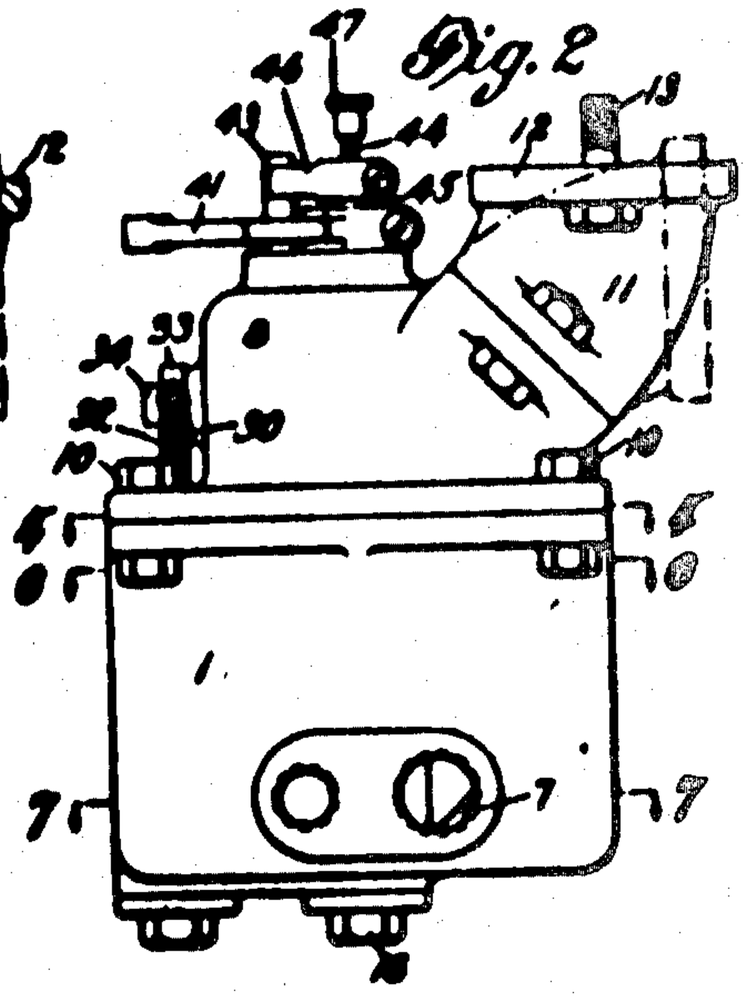


Fig. 2



Witnesses:

Inventor

S. I. PRESCOTT.
CARBURETER.
APPLICATION FILED APR. 21, 1910.

994,195.

Patented June 6, 1911.

2 SHEETS—SHEET 2.

Fig. 5

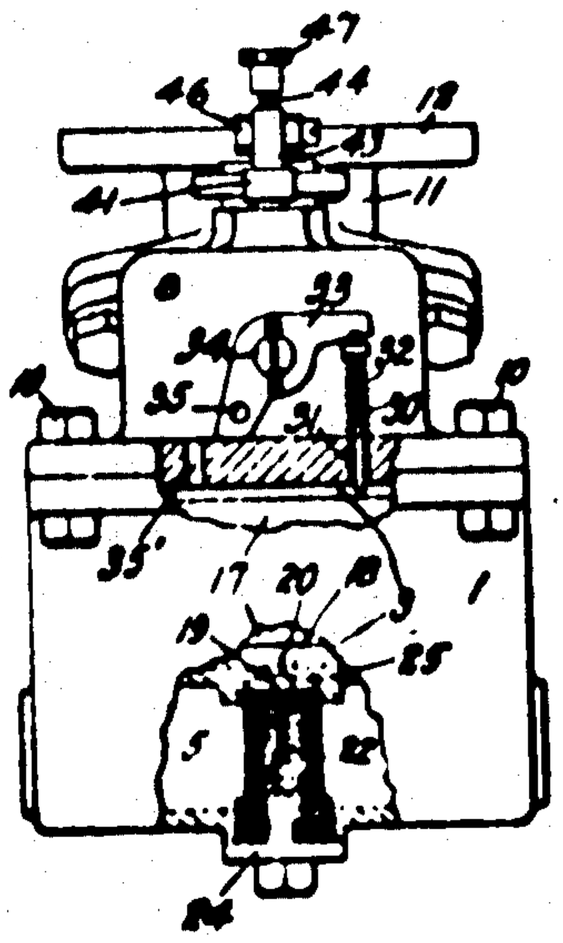


Fig. 6

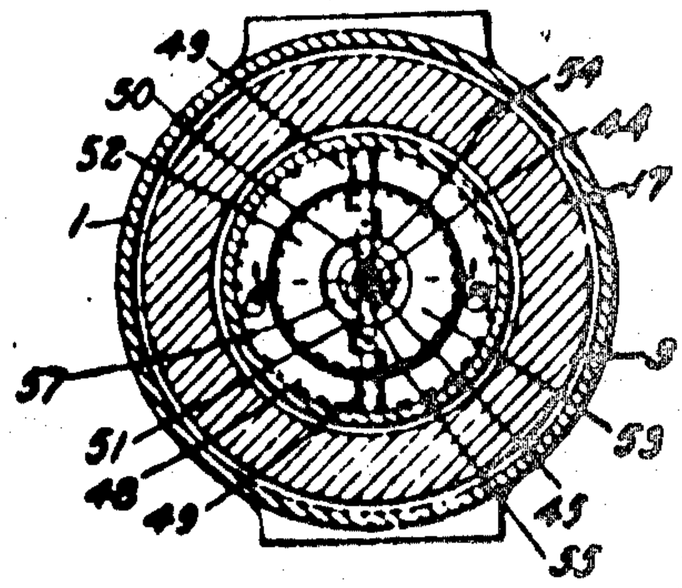


Fig. 7

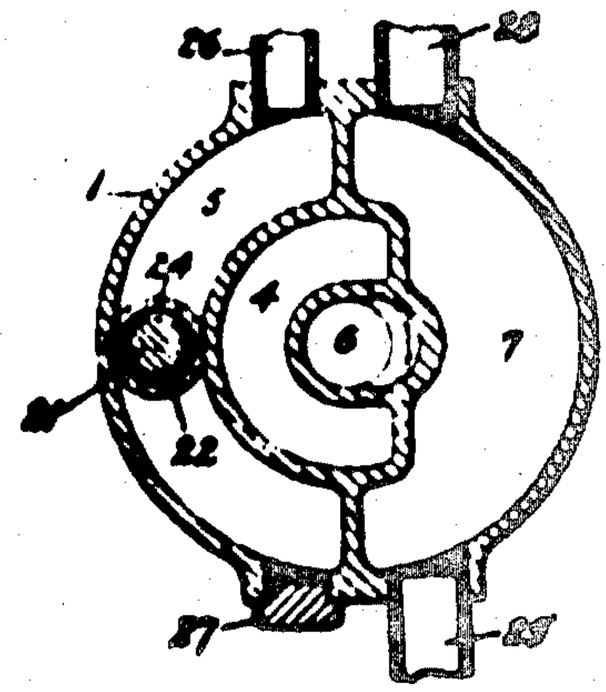
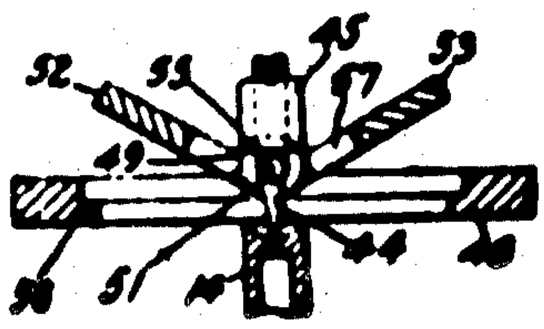


Fig. 8



Attest
Emil Klingh.
M. F. Jacobus

Inventor
Sidney I. Prescott

994,195. CARBURETER. SYDNEY I. PRESCOTT, New York, N. Y., assignor to Jonathan Peterson, Brooklyn, N. Y. Filed Apr. 21, 1910. Serial No. 556,802.

To all whom it may concern:

Be it known that I, SYDNEY I. PRESCOTT, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Improvement in Carbureters, of which the following is a specification.

This invention relates to an improvement in carbureters of the type in which the flow of fluid to the carbureting chamber is automatically varied in accordance with variations in the flow of air to the carbureting chamber and one of the objects thereof is to provide a device of this general character in which a mixture of increased efficiency is obtained.

Another object is to provide a device in which the fluid is subjected to the action of heat before it is injected into the mixing chamber to facilitate its vaporization.

A further object is to provide a device in which the mixture is always formed at one point, regardless of the variations of air drawn thereinto.

Still another object is to provide a device simple in construction, inexpensive, readily assembled and taken apart, easy to clean and keep clean, and not liable to derangement.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter fully described, and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same parts, Figure 1 is a plan view of a device constructed in accordance with the invention; Fig. 2 is a side elevation of the structure shown in Fig. 1; Fig. 3 is a sectional elevation, taken on the line 3—3 in Fig. 1; Fig. 4 is a sectional view taken on the line 4—4 in Fig. 2; Fig. 5 is an end elevation of the structure shown in Fig. 1, partly broken away to show certain parts; Fig. 6 is a sectional view taken on the line 6—6 in Fig. 2; Fig. 7 is a sectional view taken on the line 7—7 in Fig. 2; and Fig. 8 is an enlarged detail view taken on the line 8—8 in Fig. 6.

In carrying the invention into effect there is provided a casing for the principal elements of the structure, and this casing may vary within wide limits. In the best constructions, however, and as shown, there is provided a substantially cylindrical casing 1, constructed of metal and having partitions dividing it into a series of chambers the purpose of which will be hereinafter explained. These chambers, briefly described, are: a cylindrical carbureting chamber 2, an annular float chamber 3 concentric with the carbureting chamber, an air intake 4 in communication with the carbureting chamber, a fluid inlet chamber 5 in communication with the float chamber, a fluid conduit 6 in communication with the float chamber, and a heating chamber 7 adjacent the conduit. There is also provided a cap 8 having an outlet or throttle passage 9 in communication with the carbureting chamber 2. The casing 1 and cap 8 are secured together by means of a series of bolts 10. It is obvious, however, that other fastening devices may be used for this purpose if desired. Secured to the cap 8 is an elbow 11 having a passage therethrough which is an extension of the throttle passage 9 before referred to. This elbow is provided with a flange 12 arranged to be connected to the manifold of an engine with which the device is used by means of bolts 13. It will be seen that this elbow is reversible as indicated by the dotted lines in Figs. 2 and 3, the purpose of this structure being to enable the device to be attached to engines having either vertically or horizontally opening manifolds, without intermediate connections.

For the purpose of feeding fluid to the carbureting chamber, there is provided a fluid nozzle 14 of a well known construction and which is threaded in a boss 15 formed in the wall separating the air intake 4 from the conduit 6 before referred to. It will be readily understood that the nozzle may be adjusted; that is to say, moved longitudinally up or down at will. This movement is necessary to vary the position of the delivery end of the nozzle in accordance with a varying level of the fluid within the float chamber due to varying density of the fluid or varying buoyancy of the float. This adjustment of the nozzle is ordinarily made at the factory, and further adjustment is unnecessary. There is therefore provided a plug 16 threaded into the casing 1, which tightly closes the lower opening of the conduit 6. The conduit is in open communication with the interior of the nozzle 14, and the fluid flows freely from the conduit into the nozzle.

Within the float chamber 3 is an annular float 17 made of wood or cork covered with shellac; or, a hollow metal float may be used if desired. By an inspection of Fig. 3, it will be seen that the float chamber is always in open communication with the conduit 6, and it will be understood that fluid freely flows from the float chamber to the conduit. Fluid enters the float chamber through a port 18 which is normally closed

994195

by a valve 19. This valve is in the form of a hemisphere having a stem 20 projecting into the float chamber. When the annular float 17 falls with the fluid within the float chamber 3, it will strike and depress the stem 20, which in turn will force the valve 19 off its seat in the port 18, thereby permitting fluid to flow from the fluid inlet chamber 5 to the float chamber. The valve 19 is supported by a float 21 within the inlet chamber 5. It will be understood that the buoyancy of this float is insufficient to keep the valve closed when the float 17 is resting upon the stem 20. Its buoyancy, however, is sufficient to keep the valve closed when the float 17 is out of contact with the stem 20. The tendency of the float 21 is to turn over or capsize. This is prevented by the stem 20 engaging the port 18, and by the walls within which the valve is mounted. The primary object of mounting the valve on this float, instead of providing a spring seated valve of the ordinary type, is to cause the valve to displace any very small particle of sediment that may have lodged on the valve seat thereby preventing the perfect operation of the valve. The constant vibration of the device when in use, aided by the tendency of the float 21 to turn over, will produce a slight movement of the valve on its seat without opening the port. This slight movement is sufficient to dislodge any smal particle of sediment trapped on the valve seat.

For the purpose of preventing sediment, or any solid impurities, from passing into the float chamber, there is provided a filtering screen 22 through which the fluid passes from the chamber 5 to the port 18. This screen may be variously mounted. As shown, however, it is fixed upon an extension 23 of a plug 24 threaded into the bottom of the casing 1 at a point opposite the port 18. This screen is cylindrical in form and fits closely in a recess 25 formed in one of the partition walls of the casing 1 adjacent the port 18. Within the walls of this screen is positioned the float 21. By an inspection of Figs. 3 and 5, it will be readily understood that when the plug 24 is unscrewed from its seat, the screen 22 and the valve 19 and float 21 come with it, and that this action results in the perfect drainage of the chamber 5 and easy inspection of the valve and float. It may be here remarked that the extension 23 of the plug 24 is above any sediment settling along the bottom of the chamber 5. Fluid is led to the chamber 5 through a pipe 26, Fig. 7, from a suitable reservoir not shown. At the opposite side of the device and at the other end of the chamber 5 is an opening closed by a screw plug 27. When it is more convenient to place the reservoir on the other side of the device, the pipe and plug may be reversed in position.

For the purpose of facilitating the vaporization of the fluid at the nozzle, the heating chamber 7 before referred to is provided. A part of the hot exhaust gases from the engine in connection with which the device is used, is led through the pipe 28 into the chamber 7, and then out through the pipe 29. It is of course to be understood that this heating device may or may not be used as desired.

It is customary, in starting an engine, to "tickle" the carbureter to cause a small quantity of fluid to overflow the nozzle. In the present device, therefore, there is provided what may be termed a tickling pin 30 projecting through an aperture 31 in the cap 8 into the float chamber 3 directly over the float 17, Fig. 5. This pin is normally held out of contact with the float 17 by a spring 32, which also serves to hold the upper end of the pin in contact with one arm of a lever 33 journaled on a stud 34 fixed in the wall of the cap 8. The opposite arm of this lever is provided with a hole 35 by means of which a cord may be secured to the lever and led to a point distant from the pin. There is provided a second aperture 35′ in the cap, and if it is desired to lead the cord from the lever in the opposite direction, the pin may be withdrawn from the aperture 31, placed in the aperture 35′, and the lever reversed. It will be understood that by depressing the tickling pin, its lower end will come into contact with and depress the float 17, which in turn will depress the stem 20 and open the port 18 to flood the float chamber, in the usual way.

There is provided what may be termed a single open air intake substantially equaling in capacity the throttle passage and terminating adjacent the nozzle; that is to say, the capacity of the single air intake is sufficient to freely pass the maximum quantity of air used in the device under overload conditions, to the carbureting chamber. It is to be understood that the bottom of the carbureting chamber is located at the level of the upper end of the nozzle 14, for the reason that it is here that mixing begins. The nozzle, therefore, lies at one end of the carbureting chamber. The intake 4 is semicircular in shape, Fig. 7, and open to the atmosphere. Its cross sectional area is substantially equal to the cross sectional area of the throttle passage 9. At the point where carbureting begins, therefore, there is always instantly available the maximum quantity of air required, and it will be noted that the air at this point surrounds the nozzle 14, Fig. 3. At the other end of the carbureting chamber 2 there is provided a throttle marking the beginning of what is

994195

termed the throttle passage 9. This throttle may vary within wide limits. As shown, however, it consists of a plate 36 clamped between the casing 1 and cap 8, Fig. 3. This plate is provided with a plurality of apertures 37 affording a plurality of passages from the carbureting chamber to the throttle passage. Operating in conjunction with this plate is a rotattory plate 38 provided with a plurality of apertures 39 corresponding with the apertures 37 of the fixed plate. This is a well known valve construction and a further description is believed to be unnecessary. The rotary plate 38 is provided with a hollow stem 40 projecting through the top of the cap 8, and upon its upper end is clamped an arm 41, to the free end of which may be attached a rod for moving the arm. The movement of the arm is limited by the coöperation of a slot 42 formed in the arm and a post 43 fixed in the cap 8. As shown in Figs. 1, 3 and 4, the throttle is half open. A movement of the arm 41 in one direction will close, and a movement in the other direction will open, the throttle.

Within the carbureting chamber; that is to say, between the nozzle 14 and the throttle 36—38, there is provided a valve and connections for proportionately varying the flow of air and fluid to the mixing chamber, and this valve and these connections may vary within wide limits. As shown, however, a needle valve 44 is provided, this valve coöperating with the nozzle 14 to control the flow of fluid to the carbureting chamber. This valve is threaded in a sleeve 45 which is free to slide longitudinally within the hollow stem 40 of the throttle. Upon the upper end of the sleeve, which projects above the upper end of the stem 40, is clamped a forked arm 46 which engages the post 43 before referred to. The engagement of the forked arm with the post prevents the sleeve from turning upon its axis but does not interfere with its sliding movement. Upon the upper projecting end of the needle valve is fixed a knob 47 by means of which the valve may be adjusted in the sleeve toward or away from the nozzle 14.

Coöperating with the needle valve and sleeve is a two-part airgate, Figs. 3, 6 and 8. Driven or otherwise fastened in the carbureting chamber is an annular ring 48 having bosses 49 in which are journaled two pintles 50 and 51. The pintle 50 is fixed to a semi-circular gate 52, and the pintle 51 is fixed to a similar gate 53. The inner ends of these pintles are flattened at 54 and 55 respectively, the flattened ends serving as cams upon which the sleeve 45 rests. The gates are normally held by gravity upon the shoulder 56 formed in the ring 48. When the gates are in this position, the flattened ends of the pintles lie in a horizontal plane and the needle valve is in its lowest position. The two-part airgate just described is provided with an aperture 57 for the passage of air and fluid under minimum suction. When the suction exceeds the minimum, one or both parts of the airgate will be raised thereby. As the pintles are fixed to the parts of the airgate, one or both will be rotated, this action resulting in operating the cams on the pintle ends to lift the sleeve 45, as shown in Fig. 8. The sleeve carries the needle valve with it, and the discharge opening of the nozzle 14 is thereby increased in size and more fluid is permitted to flow from the nozzle. When the suction decreases, the airgate drops to its normal position and the sleeve and valve also drop to their normal positions. In the construction shown, which is the preferred construction, the valve is adjusted initially by screwing it down until it seats lightly on the nozzle and then turning it back slightly to produce a very small opening in the end of the nozzle, just sufficient to permit enough fluid to pass to the carbureting chamber to charge the minimum quantity of air passing through the aperture 57 under starting or "no load" conditions. Thereafter, as suction increases, both fluid and air are admitted in proportionately increasing quantities to the maximum.

It will be readily seen that the valve may be adjusted at any time by simply turning the knob 47 and without disturbing any other part of the device. It will be readily seen also that in the event of any obstruction in the nozzle, the valve and sleeve may be lifted out of the device without disturbing any other part of the device, and a wire inserted to clear the nozzle.

It will be readily seen that the maximum quantities of air and fluid are always available exactly at the point where carbureting begins, and that the variation of flow of both fluid and air is produced instantly and at one point by the varying suction. There is, therefore, but one carbureting operation at one place under all conditions, as distinguished from the carbureting of a minimum quantity of air with a minimum quantity of fluid, after which more air is added to the flowing stream of mixture. The mixture, as it passes the throttle, is divided into a plurality of streams which re-unite immediately after passing the throttle. There is, therefore, at the throttle, a slight deflection of a portion of the flowing stream of mixture which serves to make the mixture still more homogeneous.

In view of the foregoing, and of what is already known, a more detailed description of the operation of the device is deemed unnecessary, and is therefore omitted in the interest of brevity and clearness.

994195

Changes and variations may be made in the structure by means of which the invention is carried into effect. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. In a carbureter, the combination with a fluid nozzle, of a valve coöperating therewith, a support for the valve, a two-part airgate, and cams connected with the airgate and contacting with the support, whereby a movement of either part of the airgate produces a movement of the valve and support.

2. In a carbureter, the combination with a fluid nozzle, of a needle valve coöperating therewith, a sleeve for supporting the valve, a two-part airgate, and cams connected with the airgate and contacting with the sleeve, whereby a movement of either part of the airgate produces a movement of the valve and sleeve.

3. In a carbureter, the combination with a fluid nozzle, of a threaded valve coöperating therewith, an internally threaded sleeve for supporting the valve adjustably, a two-part airgate, and cams connected with the airgate and contacting with the sleeve, whereby a movement of either part of the airgate produces a movement of the sleeve and valve.

4. In a carbureter, the combination with a fluid nozzle, of a threaded needle valve coöperating therewith, an internally threaded sleeve for supporting the valve adjustably, a two-part airgate, a pintle secured to each part of the airgate, and a cam formed on one end of each pintle and contacting with and supporting the sleeve.

5. In a carbureter, the combination with a vertical fluid nozzle, of a threaded needle valve coöperating therewith, an internally threaded sleeve for supporting the valve, a two-part airgate normally lying in a horizontal plane, a pintle secured to each part of the airgate, a cam formed on one end of each pintle and contacting with and supporting the sleeve, an arm carried by the sleeve, and a post upon which the arm slides.

6. In a carbureter, the combination with a substantially cylindrical casing having a carbureting chamber centrally located therein, a fluid nozzle at one end and in line with the axis of the chamber, a rotatory throttle at the other end of the carbureting chamber, a hollow cap for the casing, a hollow throttle stem projecting through the cap in line with the axis of the carbureting chamber, an arm secured to the projecting end of the stem for turning it, a sleeve within and projecting beyond the stem, an arm secured to the projecting end of the sleeve, a post engaging the sleeve arm, and a needle valve threaded in the sleeve and coöperating with the nozzle.

7. In a carbureter, the combination with a fluid nozzle, of a valve coöperating therewith, a support for the valve, a two-part airgate having an aperture for the passage of air and fluid under minimum suction, and cams connected with the airgate and contacting with the support, whereby a movement of either part of the airgate under suction greater than the minimum produces a movement of the valve.

8. In a carbureter, the combination with a two-part airgate the parts of which are independently movable, of two cams spaced apart and one carried by each part of the airgate, a sleeve contacting with the cams, and a valve supported by the sleeve between the cams.

9. In a carbureter, the combination with a two-part airgate the parts of which are interlocked, a pair of pintles spaced apart on a common axis and supporting the airgate, a pair of cams formed on the adjacent ends of the pintles, a sleeve contacting with the cams, and a valve supported by the sleeve between the cams.

10. In a carbureter, the combination with a two-part airgate the parts of which are semi-circular and interlocked, of a pair of pintles spaced apart on a common axis and supporting the airgate, a pair of cams formed on the adjacent ends of the pintles, a sleeve contacting with the cams at the center of the airgate, and a valve supported by the sleeve between the cams.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

SYDNEY I. PRESCOTT.

Witnesses:

R. J. BOYLAN,

FRANK H. VICK, Jr.